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December 22, 2008

The Honorable Kevin Martin
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: WC Docket No. 06-122, Universal Service Contribution Methodology;
CC Docket No. 96-45, Federal-State Joint Board on Universal Service

Dear Chairman Martin:

We write because we are greatly concerned that the Commission, in its attempt to bring resolution to the anomalies and uncertainties of the current Universal Service Fund (USF) contribution system as part of the above-referenced proceeding, is about to create some unintended and highly undesirable consequences for a rapidly growing segment of wireless devices that are increasingly part of people's everyday lives. These new devices are bringing us a host of emerging services in the fields of machine-to-machine (M2M) communications and telematics that promise to benefit industries, consumers and society in a variety of new ways. As we elaborate in this letter, and as has been noted in several of the other comments submitted in this proceeding with which we are in agreement[1] the emergence of these types of services would be crippled by the proposed change in USF contribution methodology from the current revenue-based method to a fixed $1 or $.85 per assessable number. We believe that, as the Commission looks more deeply into the M2M and telematics sectors, including their broad departure from traditional use of the public telecommunications infrastructure and the positive social and economic benefits that they bring, it will find a way to secure balanced and proportionate support for the USF from those industries.

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[1] *See, e.g.*, November 25, 2008 Comments of APCO International and NEN in above-captioned dockets; November 26, 2008 Comments of Volvo Group North America and WirelessCar North America in above-captioned dockets; November 26, 2008 Comments of Toyota Motor Sales, Inc. in above-captioned dockets at page 10; November 26, 2008 Comments of ATX Group, Inc. in above-captioned dockets at pages 11-13; November 26, 2008 Comments of OnStar Corporation in above-captioned dockets at pages 6-7; December 3, 2008 Comments of BMW of North America, LLC in above-captioned dockets; December 22, 2008 Comments of Alarm Industry Communications Committee in above-captioned dockets at pages 7-8.

Aeris Communications

Aeris is an industry-leading provider of communications and information services to a broadly representative set of M2M and telematics application companies.[2] Our customers are developing creative ways to combine new generations of low cost wireless chipsets, modern high performance wireless data networks and web services-based application development in order to extend wired network infrastructure (WAN/LAN) to previously inaccessible devices. This network extension enables enhanced safety and security services and new efficiencies and new methods of doing business by means of monitoring, gathering data from and controlling large numbers of machines that are present throughout our economy and indeed throughout our society. These machines have sufficient embedded intelligence in the form of microprocessors to allow them to be programmed to act and to communicate in specific useful ways, including the initiation of data or event reporting or responding in pre-programmed ways to wireless (or wired) signals coming from an application host server somewhere on the Internet. In the next section, we give examples of some of the applications that comprise M2M and telematics today.

M2M and Telematics Applications

Aeris has been deeply involved with our customers in the entire life cycle of M2M and telematics applications – design and development, testing and deployment, and the intelligent management of M2M devices in the field. We have assisted and supported in the deployment of dozens of distinct M2M applications. For purposes of showcasing the social impact of these services, we highlight three.

> **Automatic Collision Notification.** The concept is that every vehicle would come off the assembly line with an embedded telematics device, capable of surviving even the most serious collision, providing two-way communications and a location-determination capability married to crash sensors in the vehicle. Upon the occurrence of a collision, detailed data on the collision and the geographic location of the vehicle are automatically transmitted over a wireless communications channel to a call center. A two-way voice call is established through the embedded device between the call center and the occupants of the vehicle to allow the call center technician to determine the extent and severity of any injuries prior to referring the incident to the appropriate emergency service. The call center technician is able to provide critical details that better equip the emergency responders, saving time and lives. Many of the objectives of the Commission's E911 program are being served directly through the ACN application.
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> **Electricity Demand Response.** It is widely appreciated that electricity usage reduction/conservation programs are a vital complement to bringing on line new power generation capacity needed to sustain America's economic growth.

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[2] Over the course of providing its services to the M2M and telematics industries, Aeris has served more than 100 companies deploying, collectively, more than 1,000,000 M2M or telematics devices.

Utilities relate the value of conservation and consumer behavior change programs to the number of megawatts of capacity that are saved as a result. An important component of electricity capacity is the ability to meet peak loads. The highest peaks occur during the hottest weather when air conditioning usage is at its highest. Since electricity can't be stored efficiently, utilities have to maintain sufficient capacity to meet the peak loads, even though such capacity greatly exceeds what is needed for everyday consumption. The construction of this capacity is very expensive and increasingly difficult to do in populated areas.

The ability to reduce usage peaks is a powerful lever, because it can reduce the need to build what is typically expensive and inefficient peak generating capacity. Agreements on the part of large users of electricity to voluntarily limit their usage during peak demand periods have been a mainstay of load management programs in recent years. Now, new deployments of technologically innovative products and services are being examined as a way to get large numbers of consumers to participate in demand reduction programs. Participating consumers would permit, in exchange for a fee rebate, the installation of a two-way communicating device that could receive, acknowledge and execute commands to turn off appliances at the direction of the load management center. These programs dramatically reduce the requirement to build additional capacity that is brought on line only during periods of peak demand.[3]

Break-in and Fire Monitoring. Premises monitoring for break-ins and fire hazards and emergency dispatch access have long been the mainstay services of the alarm and security industry. Advances in efficiency and reliability and cost reductions are making these services accessible to a greater proportion of the public, including to populations that may in fact be at greater risk than some of those served in the past. Better communications – notably, the increased usage of wireless networks – is a key element of this development. Reliance on wireline-only communications between a monitored premise and a central monitoring station was always difficult, in part because of the expense of the installation that needed to bypass the normal communications path to provide priority to alarm communications. Wireless – first as a backup, and then, increasingly, as the primary means of alarm communications – was beneficial in lowering the cost of providing the service. Now, alarm companies are starting to use more efficient wireless systems for audio and/or video verification of alarm conditions, which will reduce the burden of responding to false alarms – a significant issue for local public safety agencies.

Projected Growth of M2M Sector.

[3] Aeris Communications, Inc., *The Smart Utility Will Be A Connected Utility*, (White Paper) June 2008.

The development and growth of M2M communications[4] has caught the attention of major business observers [5]and research analysis firms[6]. The combination of low cost hardware with more ubiquitous and cost-effective wireless data networks is helping to drive the emergence of M2M communications. Analyst estimates of the market size in 2014 range from $17.1 billion to $34 billion, representing a compound annual growth rate over the period ranging from 25% to 30%.[7]

In addition to the particular applications of M2M described above, some of the industries in which M2M communication are being utilized are health care, public safety and law enforcement, transportation (land, sea and air) and financial transactions.

M2M and the Public Telecommunications Infrastructure

Any M2M application is comprised of three basic elements: a machine – a device that collects information from its environment and has some capability for acting on that environment; one or more computer programs for utilizing and displaying the information generated by the device and for providing instructions to and control of the device[8]; and, centrally, a communications medium for moving data[9].

M2M applications can and do incorporate any and all communications media: fixed wireline; cellular wireless; paging; private radio; short range unlicensed wireless; RFID; satellite radio. Of these various media, cellular appears poised for the most significant and rapid growth and is the one that would be most affected by the proposed numbers-based USF contribution scheme.

Cellular-based M2M applications are typically very light users of the public telecommunications infrastructure. For one thing, most M2M applications rely on the Internet as their mainstay, so that much of M2M communications only relies on the portion of the public network involved in the very efficient Internet backhaul. Phone numbers for the most part are used only for routing purposes, allowing data sessions to be established with wireless devices that do not have static Internet protocol (IP) addresses that can be addressed directly with an IP communication.

There is some very limited voice channel utilization in M2M applications: Legacy circuit-switched data applications (not a growth area – in fact, a sunset technology

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[4] In the balance of this letter, the expression "M2M communications" will be used to embrace both M2M per se and telematics. While telematics has elements that are not M2M, automatic transmission of data between a device and a host application, the essence of M2M communication, is an integral part of telematics.

[5] *When Everything Connects* (a special report on telecoms), THE ECONOMIST, April 28, 2007.

[6] See, e.g., Harbor Research, M2M/Pervasive Internet Market Forecast (2006).

[7] Compiled for Aeris from multiple industry analyst firms.

[8] These programs are often themselves referred to as the "application," but in fact the application requires all three elements.

[9] Data which can, but need not, be information, if the M2M device itself includes some capability for processing and refining the data that it gathers.

application); alarm event voice communication ancillary to a data driven event notification, like the ACN and security monitoring applications.

SMS is used in some applications, typically anywhere from a handful of messages (less than five per month) up to four or five per day.

Numbers-Based Contribution and the Economics of M2M

Most M2M applications that are cellular based are relatively low usage – most often measured in kilobytes per month, not megabytes. In Aeris's projections of 2009 utilization by our customers, we anticipate an average per device per month of 300 KB of data, less than one minute of voice (the large majority of applications use no voice at all) and 5 SMS messages.

One of the key reasons that cellular-based M2M applications are developed on a low usage model is cost. M2M applications exhibit extreme sensitivity to cost. They are always developed by or for operating businesses and have a return on investment case that they must meet to receive management approval. We estimate that our charges to our customers for telecommunications services in 2009 will average $1.40 per device per month.

The balance of economic incentives and disincentives to build and deploy M2M applications will be materially altered if the proposals that would add between $.85 and $1.00 per device per month are adopted and applied as written. For many applications, this charge would double or more than double the network cost.

In our view, most companies that are planning the roll-out of an M2M applications will at least examine the possibility of substituting for cellular (or numbers-based wireline) technology a different communications technology that is not subject to any USF contribution obligation, for example, private radio or mesh networks with multiple endpoint devices backhauled from a single number. We believe that the Commission should view this as an unfavorable outcome. Economics altered by the USF contribution charge will drive usage away from what is technically the most efficient solution (or it would not have been chosen in the first place), thereby raising the overall social cost for obtaining the social goods represented by these applications. Further, and more specific to the purposes of the current proposal, to the extent that this type of technology substitution is economically feasible, it will have the effect of narrowing the USF contribution base.

Some applications will find no economically feasible substitute for cellular communications, particularly in rural areas where the lack of population density does not support a mesh wireless network. The economics of the business case that supported rolling out an M2M solution may fall apart when the cost base increases so significantly, and companies find that they do not have the ability to pass these cost increases on to an end user who will pay for them. The automotive telematics application is a prime case in point. Examples drawn from actual data are developed in comments in this proceeding from the automobile industry and their telematics application providers.[10] In such cases, the change in economics may cause the affected companies to drop their plans for rolling out an M2M application to the loss - not only economic loss to the companies involved -

[10]See. e.g., Comments filed under the above-referenced docket numbers on behalf of The ATX Group and OnStar Corporation.

but to society at large with respect to the social benefits (in the automotive case – enhanced safety and security) that would have been derived from widespread adoption of the application.

Conclusions

1. **USF Policy**. We have no argument with the underlying policy of Universal Service and, in general, the mechanisms adopted by the Commission to further the policy. As a 499 registrant, Aeris will continue to adhere to the Commission's rules and requirement regarding USF contributions.
2. **Proportionate Benefits and Burdens**. We do argue that the economic burdens on a segment of the telecommunications industry of contributing to universal service should bear some reasonable proportionate relationship to the economic benefits derived by that segment from the usage of the public telecommunications infrastructure. Where the usage, and hence the cost imposed by the usage, is light, the burden should not be unduly heavy.
3. **Social Good**. We believe that the Commission should take into account the net social good of the M2M applications that are currently being and will be deployed in the future. We think it is appropriate for the Commission to weigh in the balance how much of that social good might be jeopardized in an attempt to simplify the USF contribution regime with a proposal that ignores the impact of this rule change on the M2M industry.
4. **Alternatives**. We think that the policies of the Commission with respect to the USF will be served and will be well balanced with the needs of the M2M industry if an accommodation is made that would permit contributions from registrants in this sector to be reasonable and proportionate. One way to achieve this balance would be to continue to base contributions on revenues derived from provision of telecommunications, with perhaps a simplified reporting and calculation scheme that would ease the administrative burden on both registrants and USAC staff of administering the contributions. Another productive path to the same end could be to base contribution on actual usage, such that the economic burden of contribution is scaled proportionately to the cost to the telecommunications industry as a whole of supporting that usage by the M2M industry.

Thank you for your consideration.

Respectfully submitted,

/s/

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